Discussion of Rejection of Claims 1-14 and 43

Claims 1-14 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Meggers in view of Heddes and in further view of Yamaguchi.

The Examiner acknowledges that Meggers and Heddes do not disclose that the deadline for determining that a next packet of a real-time stream is to be transmitted before other packets of the streams is derived from at least one of a pre-existing synchronization time stamp and a pre-existing synchronization time-reference extracted from one or more of the packets carried in the plurality of streams, as set forth in independent claims 1 and 43. The Examiner relies on Yamaguchi as disclosing this subject matter.

Yamaguchi discloses a method and apparatus for processing a data series including priority data. Yamaguchi is concerned with adjusting the receiving side decoding priorities to avoid delays, to enable processing of two pictures simultaneously, or to define a processing priority in the case of an overload (See, e.g., Col. 11, lines 8-13, Col. 14, lines 5-7 and lines 46-52). To enable the forgoing, Yamaguchi artificially adds priorities to both the data streams and to each frame in the streams (Col. 13, line 49 through Col. 14, line 57, in particular Col. 14, lines 37-40; see also Col. 17, lines 12-16).

In contrast to Yamaguchi, with Applicants' claim 1, the deadline is derived from at least one of a pre-existing synchronization time stamp and a pre-existing synchronization time reference extracted from one or more of said packets carried in said plurality of streams, and not a deadline added to the stream or the frames of the streams, as is the case in Yamaguchi.

Also, with Applicants' claim 1, the deadline at issue is a deadline for transmission of the packets which determines when a packet is to be output from a buffer and into a digital multiplex for transmission to a receiver over a communications channel. In contrast, Yamaguchi is concerned with decoding priorities of encoded streams at the receiver.

The foregoing arguments apply equally to Applicants' independent claim 43, which includes corresponding subject matter.

Accordingly, the combination of Meggers, Heddes, and Yamaguchi does not disclose or remotely suggest a priority deadline for transmission of a packet that is derived from at least one

of a pre-existing synchronization time stamp and a pre-existing synchronization time reference extracted from one or more of said packets carried in said plurality of streams, as claimed by Applicants in amended independent claims 1 and 43.

Further, Applicants respectfully submit that one skilled in the art would not have been motivated to combine the disclosures of Meggers, Heddes, and Yamaguchi as suggested by the Examiner. Meggers relates to modification of real-time streams, Heddes relates to a computer networking system, and Yamaguchi relates to adding priorities for decoding on the receiving side to avoid problems at the decoder. Only with hindsight impermissibly gained from Applicants' disclosure could one of ordinary skill in the art have arrived at the conclusions reached by the Examiner.

Applicants respectfully submit that the present invention as set forth in independent claims 1 and 43 would not have been obvious to one skilled in the art based on Meggers in view of Heddes and Yamaguchi.

Discussion of Rejection of Claims 15-20

Claims 15-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Monta in view of Chiussi.

Monta describes a system for combining multiple streams for transmission over a channel. In Monta, if channel capacity is insufficient, then streams are further compressed in order to fit the existing channel capacity (Col. 15, lines 15-27). Monta does not disclose or suggest identifying a first digital multiplex of a plurality of digital multiplexes having a first amount of data that is being transmitted over a first communication channel, where the first amount exceeds a first threshold for the first communication channel and identifying a second digital multiplex of a plurality of digital multiplexes having a second amount of data that is being transmitted over a second communication channel, where the second amount does not exceed a second threshold for the second communication channel.

In addition, the portions of Monta relied on by the Examiner have little to do with the language of Applicants' claim 15. For example, the Examiner equates certain steps of Figure 4A

and 4B of Monta with Applicants' claim 15 subject matter. Figure 4A and 4B of Monta illustrate a flowchart of <u>a process for encapsulating MPEG packets into Ethernet packets</u> carried out by IP wrapper circuit 12 to gather multiple MPEG packets of the same PID for encapsulation into the same Ethernet packet (Col. 7, lines 48-52). Figure 4A and 4B have nothing to do with identifying digital multiplexes and determining whether an amount of data exceeds a threshold of its communication channel. In particular, the Examiner equates step 87 of Figure 4A of Monta with "identifying a first multiplex with a first amount of data in a first channel" (Office Action, page 7). Step 87 of Monta refers to listening to a stream until a hex 47 is found, which marks the beginning of a packet. This information is then used in later steps of Figure 4A and 4B of Monta to determine if synchronization is present (Col. 8, lines 1-20). Similarly, the Examiner equates reference numeral 97 of Monta as equivalent to "the amount of data in the first channel exceeding a first threshold" (Office Action, page 7). Step 97 of Figure 4A of Monta is a counter that repeats steps 87-95 until N number of hex 47s have been found, which confirms synchronization (Col. 8, lines 1-20). Step 97 of Monta has nothing to do with determining if an amount of data exceeds a threshold. The remaining references to Monta made in the rejection of claim 15 are similarly misplaced.

Further, it should be appreciated that the recompression performed in Monta degrades video quality, while stream reassignment as performed with Applicants' claimed invention does not.

It is also noted that, in connection with the rejection of claim 24, the Examiner acknowledges that Monta <u>does not disclose</u> "determining an available channel capacity of a first channel or an available channel capacity of a second channel and in the event that the available channel capacity of the first channel is sufficient to accommodate a first subset of data selecting that subset for transmission on the first channel" (Office Action, page 11). It is respectfully submitted that the foregoing is inconsistent with the rejection of claim 15 where the Examiner takes the position that Monta discloses determining whether an amount of data in a first channel exceeds a threshold (how can Monta determine if the data threshold is exceeded if it cannot determine channel capacity as acknowledged by the Examiner?).

The Examiner has acknowledged that Monta does not disclose reassigning or transferring a subset of streams to a different multiplex (Office Action, page 7). The Examiner relies on Chiussi as disclosing such a reassignment of a subset of streams.

Chiussi is related to a method for integrating guaranteed-bandwidth and best-effort traffic in a packet network. With guaranteed-bandwidth (GB) traffic, schedulers provide bandwidth guarantees and with best-effort (BE) traffic there are no such bandwidth requirements but rather "service fairness" is provided to such traffic. Chiussi attempts to solve the problem of integrating these different systems (Col. 1, lines 14-53). To do so, Chiussi provides a WRR scheduler comprised of two separate WRR schedulers. A primary WRR scheduler PWS 401 distributes the service to the individual GB flows 402 and determines the amount of service that the BE flow aggregate should receive during each frame. The secondary WRR scheduler SWS 404 takes care of fairly distributing the service share of the BE flow aggregate from over the individual BE flows 405. The WRR scheduler (PWS 401 and SWS 404) achieves the finest granularity in transferring unused bandwidth from GB to BE flows (Col. 7, lines 9-19)

Thus, Chiussi shifts available bandwidth from GB flows for use by the BE flows to improve the quality of the BE flows when possible. Chiussi does not disclose or remotely suggest selecting a subset of a plurality of streams being transmitted over a first digital multiplex on a first communication channel and reassigning this subset to a second digital multiplex on a second communication channel based on a determination of channel thresholds, as claimed by Applicants in independent claim 15.

Rather, Chiussi makes unused GB flow bandwidth available for BE flows. There is no reassignment of subsets of data streams from one channel to another in Chiussi.

In addition, the Examiner equates step S610 of Figure 7C of Chiussi with "checking a first threshold" (Office Action, page 7). With Applicants' invention as set forth in claim 15, a first digital multiplex of said plurality of digital multiplexes is identified which has a first amount of data that is being transmitted over a first communication channel, where the first amount exceeds a first threshold for the first communication channel. Step S610 of Chiussi checks a value of a timestamp, and as such has nothing to do with a data threshold for a communication

channel.

The Examiner also equates step S730 of Figure 7E of Chiussi with checking a second threshold. Step S730 of Chiussi determines if there is any backlogged flow in SWS 404 FIFO queue 511 (Col. 12, lines 56-57). Determining a buffer <u>backlog</u> is not equivalent to Applicants' claimed identification of a second digital multiplex of a plurality of digital multiplexes having a second amount of data that is being transmitted over a second communication channel, where the second amount <u>does not exceed a second threshold</u> for the second communication channel.

Further, the Examiner equates step S740 of Figure 7E of Chiussi with "the reassigning or transferring a subset of <u>channels</u> to a different multiplexed channel set" (Office Action, page 7). It is respectfully submitted that the Examiner has mischaracterized Applicants' claimed language. Applicants' independent claim 15 specifies "<u>selecting a subset of said plurality of streams</u> being transmitted over said first digital multiplex" and "<u>reassigning said subset to said second digital multiplex</u>". In addition, step S740 of Chiussi sets the BE cumulative share equal to the BE running share. It is Applicants' understanding that setting the BE cumulative share equal to the running share when there is a backlog in the BE FIFO buffer 511 maintains the distribution of service flow from GB to BE and does not represent a "transfer of a subset of channels to a different multiplexed channel set" as assumed by the Examiner (See, e.g., Col. 9, line 15 through Col. 10, line 13 of Chiussi).

Applicants respectfully submit that the present invention ass set forth in independent claim 15would not have been obvious to one skilled in the art based on Monta in view of Chiussi.

<u>Discussion of Rejection of Claims 24-27</u>

Claims 24-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Monta in view of Chiussi.

As discussed above, Monta describes a system for combining multiple streams for transmission over a channel. In Monta, if channel capacity is insufficient, then streams are <u>further compressed</u> in order to fit the existing channel capacity (Col. 15, lines 15-27). The Examiner

acknowledges that Monta does not disclose <u>determining or estimating a channel capacity of a</u>
<u>first and a second channel, and selecting a first subset for transmission through a first channel in</u>
<u>the event the available channel capacity of the first channel is sufficient to accommodate the first</u>
<u>subset of data</u>, as claimed by Applicants.

Examiner refers to paragraph 14, lines 30 to 38 of Monta as support for disclosing "using
a selected channel for transmission rather than a second channel" (Office Action, page 11). The
cited portion of Monta relied on by the Examiner refers to a selection made to accommodate <u>a</u>
<u>limitation on the number of tuners available</u> at a particular receiver. This section has nothing to
do with channel selection based on channel capacity or the existence of real-time data. In Monta,
there is no need (or mention) of assignment of a stream to a particular communication channel
based on whether it includes real-time data or not, as is the case with Applicants' claim 24.

Examiner also refers to Figure 2 and Col. 13, lines 26-38 of Monta as disclosing
classifying data differently than other subsets of data using PIDS (Office Action, page 11).
Applicants respectfully submit that Figure 2 and Col. 13, lines 26-38 of Monta disclose a well-
known method of encapsulating MPEG transport packets into the Ethernet frames used in IP
networks. According to the MPEG transport packet spec (ISO 13818-1), all packets must include
a PID in the header, and this PID is used to identify the stream that is associated with the packet.
Since a subset of data generally consists of multiple video, audio, and data streams, each of
which must be identified by a unique PID, there is no reason to believe that Monta is somehow
using these same PIDs to identify a first or second subset, as is apparently assumed by the
Examiner.

Accordingly, Monta does not disclose or remotely suggest determining whether a first
subset of data associated with a first stream includes real-time data, <u>classifying the first subset of</u>
<u>data to distinguish it from a second subset of data associated with a second stream based on a</u>
<u>determination that the first subset includes real-time data, determining or estimating an available</u>
<u>channel capacity of a first channel and an available channel capacity of a second channel,</u> where
<u>the first subset of data is then selected for transmission through a first channel rather than</u>
<u>through a second channel in the event that the available channel capacity of the first channel is</u>

<u>sufficient to accommodate the first subset of data</u>, as is claimed by Applicants in claim 24. It is also noted in this regard that, in connection with the rejection of claim 15, the Examiner has acknowledged that Monta does not disclose *"reassigning or transferring a subset to a different multiplex"* (Office Action, page 7). Such an acknowledgement appears inconsistent with the Examiner's position in the rejection of amended claim 24.

The Examiner relies on Chiussi as disclosing "checking a first threshold (S610 of Figure 7C) and a second threshold (S730 of Figure 7E) then reassigning or transferring a subset of channels to a different multiplexed channel set (S740 of Figure 7E; column 7, lines 17-24)" (Office Action, page 11). The foregoing is the exact reasoning the Examiner has applied in rejecting independent claim 15, and the arguments set forth above with regard to Chiussi in connection with claim 15 apply equally to independent claim 24.

In particular, Chiussi <u>shifts available bandwidth from GB flows for use by the BE flows</u> to improve the quality of the BE flows when possible. Chiussi does not disclose or remotely suggest <u>determining or estimating an available channel capacity of a first channel and an available channel capacity of a second channel</u> and selecting said first subset for transmission through <u>a first channel rather than through a second channel in the event that the available channel capacity of said first channel is sufficient to accommodate said first subset of data, when the first subset of data is determined to include real-time data</u>, as claimed by Applicants.

Applicants respectfully submit that the present invention as set forth in independent claim 24 would not have been obvious to one skilled in the art based on Monta in view of Chiussi.

With respect to Applicants' claim 25, the Examiner asserts that Monta discloses that PIDS are used for notifying receivers of updates to the data streams. Applicants' claim 25 specifies transmitting the first subset through the first channel by switching the transmission from the second channel to the first channel, and the cited portion of Monta relied on by the Examiner has nothing to do with <u>switching a subset of data from one channel to another based on a determination that it includes real-time data</u>.

Further, Applicants' respectfully submit that in Monta there is no mention of methods for

informing receivers to retune to different channels in order to continue receiving the same data stream, as is apparently assumed by the Examiner.

With respect to Applicants' claim 26, the Examiner asserts that Monta discloses "*using PID (82 of Figure 2) and re-tuning user's receivers (column 14, lines 36-39)*". In fact, Monta only discloses methods for requesting IP data from an upstream switch to be forwarded to the multiplexing device (CherryPicker) which combines multiple streams to generate the subset of data which is to be broadcasted via a particular communication channel. In Monta, the receivers are <u>downstream</u> from the multiplexer (i.e., at the other end of the channel) and are not applicable to the sections of text cited by the Examiner. More importantly, there is no suggestion by Monta that streams might be reassigned from one communication channel to another channel, nor is there any discussion of how such a reassignment decision might be made, or how the reassignment might be implemented.

Further remarks regarding the asserted relationship between Applicants' claims and the prior art are not deemed necessary, in view of the foregoing discussion. Applicants' silence as to any of the Examiner's comments is not indicative of an acquiescence to the stated grounds of rejection.
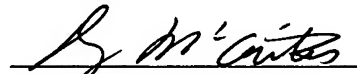
Withdrawal of the rejections under and 35 U.S.C. § 103(a) is therefore respectfully requested.

Conclusion

The Examiner is respectfully requested to reconsider this application, allow each of the pending claims and to pass this application on to an early issue. If there are any remaining issues that need to be addressed in order to place this application into condition for allowance, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,

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Date: July 14, 2010